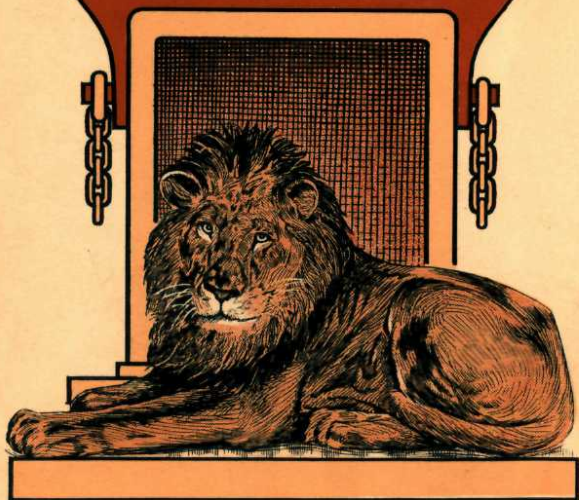


LION BLASTING MACHINES

AND LION FUZES



Made by

THE AETNA POWDER COMPANY

143 DEARBORN ST., CHICAGO

Lion Blasting Machines

Give the best
service
because they are
better built than
any other machine.

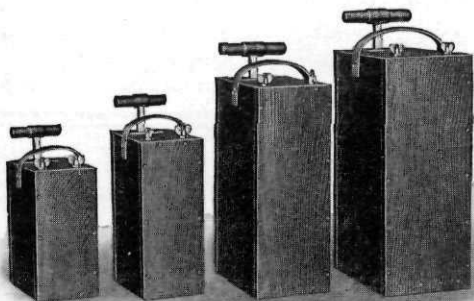
They are built at
our own electrical

works, where the Lion Fuzes are made, and
will be found to fully sustain the "Lion
Brand" reputation for reliability.

The machines are well made through-
out, work smoothly, are hard to break and
easy to repair. The design is extremely
simple, so that an ordinary workman can
keep them in good order and make slight
repairs if necessary. This simplicity of de-
sign, together with strong and durable
construction, enables us to produce a
machine which will stand well the hard
usage such things generally receive and
come as near taking care of itself as any
machine can, at the same time being easy
to care for and repair.



Lion Blasting Machines



No. 1

No. 3

No. 4

No. 5

LION No. 1. Capacity, 8 to 10 holes. This is the smallest of the Lions; weighs $18\frac{1}{2}$ pounds and the case is 11 inches high. It is used mostly for shooting wells, prospecting and any blasting where but a few charges are to be fired simultaneously.

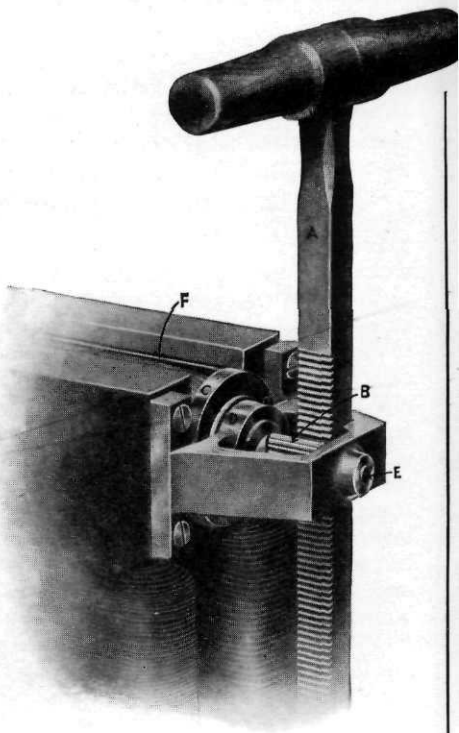
LION No. 3. Capacity, 20 to 25 holes. Weight, $22\frac{1}{2}$ pounds. Case, $13\frac{1}{2}$ inches high. This size has been, in the past, the favorite of quarrymen and railroad contractors, and more of the No. 3's have been sold than of any other size.

LION No. 4. Capacity, 30 to 50 holes. Weight, $45\frac{1}{2}$ pounds. Height of case, 18 inches. The best size for ordinary quarry work and railroad contractors' use, even if only twenty holes are to be fired at a shot,

for the extra current compensates for leaks in the blast line which are sometimes unavoidable.

LION No. 5. Capacity, 50 to 100 holes. Weight, $66\frac{1}{2}$ pounds. Height of case, $20\frac{1}{2}$ inches. A great many blasters have asked us to build a machine more powerful than the No. 4, because they wished to fire 75 to 100 holes at a shot. Others have asked for a more powerful machine because they wanted the extra current to compensate for leaks in the blast line, which are unavoidable in wet places; and to overcome the resistance of long leading wires and long length fuzes. We believe that in the No. 5 we have produced a blasting machine which is as powerful as can be made and still be easily portable and sufficiently easy to drive to enable one man to get the full current out of it. By a new patented driving device, which alone made the No. 5 possible, we have been able to produce a machine slightly larger than the No. 4, easily operated by one man, and at the same time twice as powerful as the Lion No. 4 or any other blasting machine heretofore made. It makes possible the firing of twice as many shots simultaneously as could be accomplished heretofore with a blasting machine, and is of the greatest value to any one who fires large blasts. This machine, while rated at a capacity of 50 to 100 holes, has actually fired in factory tests 180 four-foot fuzes in series, at one shot.

The Lion three point suspension
used on No. 4 and No. 5 machines.



- A—Rack bar
- B—Pinion
- C—Armature
- D—Patented Yoke Bearing
- E—Outer Bearing
- F—Air gap between Armature and Poles

T e c h n i c a l

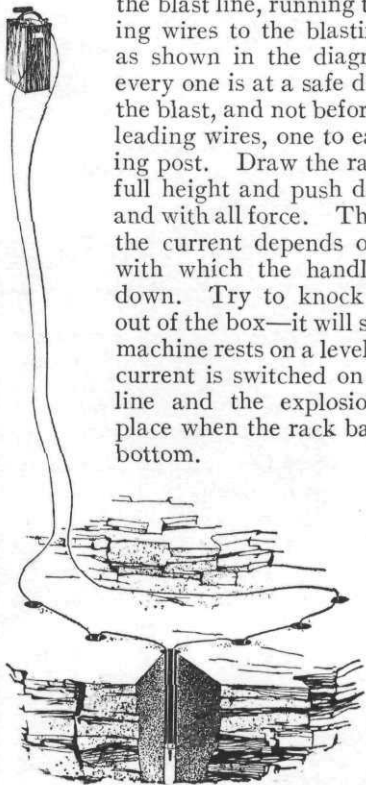
The thrust of the rack bar is opposed by the magnetic pull of the poles on the armature, acting as a brake. The shaft and pinion must be small, to avoid too long a stroke of rack bar. Other machines have a bearing at E and the other extremity of the armature shaft only. Without the third bearing at D the armature shaft is sprung by the thrust of A, varying the "air-gap" at F, which causes wide variations in the strength of current and a current of uncertain strength at the end of the stroke.

The patented yoke, giving a bearing on both sides of pinion B, takes all the thrust on the bearings D and E—the armature always runs smoothly, pinions don't break and the current is more uniform.

Lion Blasting Machine

DIRECTIONS FOR FIRING

Connect the electrical fuzes in the blast line, running the two leading wires to the blasting machine, as shown in the diagram. When every one is at a safe distance from the blast, and not before, attach the leading wires, one to each connecting post. Draw the rack bar to its full height and push down quickly and with all force. The strength of the current depends on the speed with which the handle is pushed down. Try to knock the bottom out of the box—it will stand it if the machine rests on a level place. The current is switched on to the blast line and the explosion will take place when the rack bar strikes the bottom.

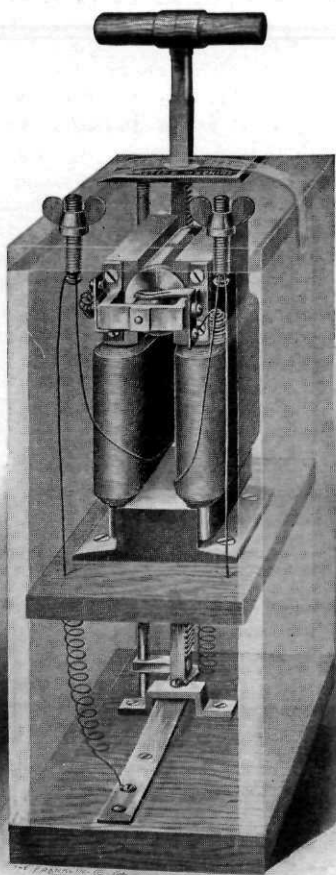


Rated Capacity

The Lion machines are rated at the number of four foot fuzes they will ordinarily fire in actual work. It is not possible, however, to say definitely just how many fuzes any particular size of machine will fire, for if longer length fuzes than four foot are used, the machine will, of course, not fire so many at a shot, due to the resistance of the increased length of wire and the greater leakage of current which takes place from the longer wires. This leakage of current varies greatly, according to the nature of the ground.

Care of the Machine

These machines do not require recharging, as many suppose. Still, a machine which has been idle for some time will not always generate the full amount of current at the first stroke of the handle, and it is therefore a good plan to "pump it up" just before firing a shot—that is, raise the handle and push it down two or three times just before firing; or lay a piece of metal across the binding posts, connecting the two, and work the handle up and down two or three times, which will bring the machine up to full strength. This applies to any blasting machine, whether a Lion or made by some one else. Some makers of blasting machines warn users of their machines that this pumping will destroy the machine; the Lion machines are so thoroughly insulated that they will stand any reasonable amount of pumping.



Care of the Machine

The rack bar as well as the extreme end bearings of the spindle should be occasionally oiled, but no oil should be put on the commutator—the little brass roller. If it seems necessary to lubricate this part, do so with graphite, or rub a lead pencil on it. The slots in the commutator should be cleaned occasionally with a piece of soft wood, for bits of copper may drop into them and cause a short circuit. The brushes will sometimes need rubbing with a file or sand-paper—don't use emery. They should bear evenly and firmly on the commutator. If the armature continues to spin after the end of the stroke, the brushes should be bent to bear down harder.

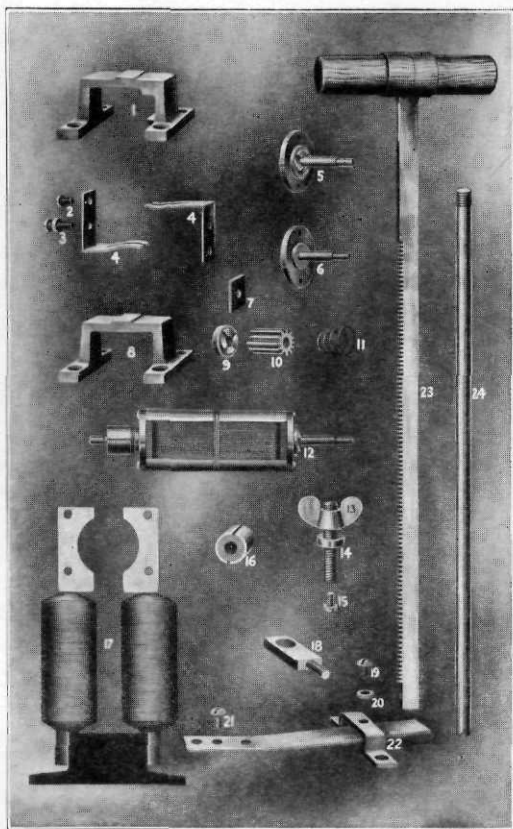
The point of the contact screw in the bottom of the box may be brightened occasionally, but seldom needs attention.

When the machine has been idle for several days it is a good plan to pump the handle up and down two or three times just before connecting the wires. This brings the machine up to full strength.

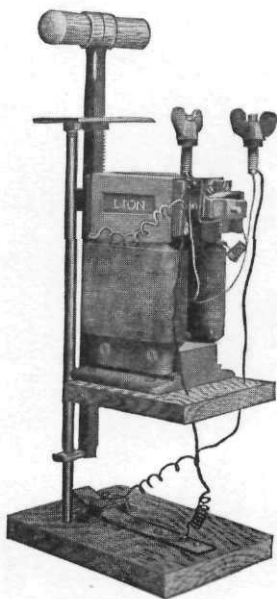
When not in use, keep in a dry place.

Price List of Parts of Lion Blasting Machines

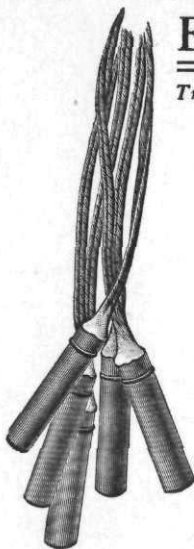
	No. 1	No. 3	No. 4	No. 5
1 Rear yoke	\$0.50	\$0.75	\$0.85	\$1.50
2 Brush connection screw	No charge			
3 Brush insulated screw	No charge			
4 Brush, per pair..	.20	.20	.20	.40
5 Spindle head with clutch	1.00	1.25	1.50	2.00
6 Spindle head for commutator end	.50	.75	.85	1.00
7 Fibre insulator	No charge			
8 Front yoke .....	.50	.75	.85	1.00
9 Clutch .....	.35	.35	.45	.50
10 Pinion .....	.50	.50	.60	.75
11 Pinion spring ...	No charge			
12 Armature com- plete	2.00	3.00	4.00	6.00
13 Wing nut .....	.10	.10	.10	.10
14 Binding post ...	.10	.10	.10	.10
15 Binding screw ..	No charge			
16 Commutator ....	.50	.50	.60	.75
17 Fields	Not furnished			
18 Guide rod yoke .	.20	.20	.25	.25
19 Platinum tipped screw .....	.10	.10	.20	.30
20 Washer	No charge			
21 Screw	No charge			
22 Shunt spring and yoke, each .....	.20	.20	.20	.20
23 Rack bar .....	.75	1.00	1.25	1.50
24 Guide rod .....	.50	.65	.75	1.00



Parts of the Lion Blasting Machine.



Lion Machine with Case removed.



Electrical Fuzes

Trade "LION BRAND" Mark

Double Wound Insulation
Every one warranted perfect

PRICE LIST

	No. 6 Double Strength Per 100	No. 7 Triple Strength Per 100
4 ft. wire	\$3.50	\$4.00
6 "	4.04	4.54
8 "	4.58	5.08
10 "	5.12	5.62
12 "	5.66	6.16
14 "	6.20	6.70
16 "	6.74	7.24
18 "	7.28	7.78
20 "	7.82	8.32
22 "	8.82	9.32
24 "	9.82	10.32
26 "	10.82	11.32
28 "	11.82	12.32
30 "	12.82	13.32

We recommend the use of a Number 6 Electrical Fuze or stronger. It means increased efficiency in the blast.

SUNDRIES

Leading Wire, common, 500 feet coil . .	\$2.50
Aetna Cable Leading Wire, per coil . .	3.00
Connecting Wire, 2-lb. spools, per pound.	.30
Leading Wire Reels, each	4.00
Rubber Insulating Tape, per ½-lb. roll .	.75
Friction Tape, per ½-lb. roll . . . . .	.50

BATTERIES

Lion No. 1—Capacity 8-10 holes . .	10.00
Lion No. 3—Capacity 20-25 holes . .	15.00
Lion No. 4—Capacity 30-50 holes . .	30.00
Lion No. 5—Capacity 50-100 holes . .	45.00

The Aetna Powder Company

7 S. DEARBORN STREET

CHICAGO

Woodward Bldg.,
BIRMINGHAM, ALA.

Bank of Commerce Bldg.
ST. LOUIS, MO.

XENIA, O. IRON MOUNTAIN, MICH. COLUMBUS, O.
DULUTH, MINN.